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Date: 1/26/02 3:39pm
Subject: Microsoft Settlement

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Honorable Judge Hesse:

Our nation currently faces far greater challenges than the market abuses of which Microsoft has been found guilty. It is tempting to quietly end this anti-trust case with a minimal or symbolic remedy. I strongly believe that this would be a mistake. A fair remedy will revive the strength and competitiveness of our computer industry. It would also greatly improve the security of our information infrastructure.

The proposed remedy has many obvious legal and technical defects which make it unlikely to be any more effective than the remedies levied in previous cases. Section III.J is a loophole which allows Microsoft to continue exposing some internal functions (APIs) and data structures to its own middleware products without publishing them to potential competitors. The unnecessarily narrow definition of "Personal Computer" allows Microsoft to punish Apple and Sun because neither use Intel X86 compatible microprocessors. I'm also concerned that the complexity of this remedy might cause Microsoft to unintentionally violate some of the terms, which would lead to further expensive court cases.

Others may have already brought these problems to your attention. As a software engineer I would like to address a different aspect of the settlement. I intend to address the national readiness and security implications of anti-competitive behavior and present a possible solution.

THE LOST DECADE (THE TECHNOLOGICAL DARK AGES)

I began working in the computer industry shortly before Microsoft released Windows 3.0. By 1985, Amiga, Apple, DEC and others had developed computer operating systems with many features which we take for granted today but which did not exist on Microsoft's dominant OS of that time: Mouse-driven graphical interface with overlapping windows, long filenames, multitasking, color, full screen multimedia video, speech synthesis. These were not fast computers but the operating systems made efficient use of the hardware and provided a level of usability and perceived performance that Microsoft would not attain for another 10 years.

By 1995 Microsoft had captured much of the PC operating system market through practices which have since been repeated in other markets. Competitors were driven into obscurity. When Windows 95 was released, it had many of the features that existed on competing operating systems of the mid 1980s. A common argument for a weak settlement is that without Microsoft, we would not have reached today's level of sophistication. On the contrary, it appears that Microsoft actually retarded the development of efficient desktop operating systems by eliminating viable competition.

WHILE WE WERE EDITING AUTOEXEC.BAT FILES...

When I first accessed the internet in the early 1990s, I was surprised to see such an active software development community outside of the United States. People from eastern Europe, Germany, Finland, and elsewhere were writing high quality software for computers which were no longer in the U.S. mainstream. We didn't know it, but our concentration on Microsoft Windows was causing us to fall behind other parts of the world. Microsoft Visual Basic and Microsoft Certifications became more important than a college degree in maintaining a software career in the U.S. When Microsoft retires a certification such as MSCE, the student must upgrade their certification lest it becomes as obsolete as Windows

95. It is much like a mechanic who learns how to fix a Model-T Ford without learning how cars work. When presented with a VW Beetle, the overly-specialized mechanic is lost. When the Microsoft monopoly finally penetrated these parts of the world, many users already knew too much. They refused to regress to the 1980s. A Finnish youth went so far as to create a new operating system. His experiment grew to become Linux, one of the most common webserver operating systems on the internet. Linux is becoming popular on desktops in Europe and according to some sources, has a 15% market share in Asia.

It may be no accident that U.S. companies are now exporting jobs to and importing software developers from countries which had active communities of software development outside of Microsoft's sphere of influence. What is known as "Open source" is currently one of the most fertile areas of software development and much of this is taking place outside of our borders. A lack of competition in the U.S. auto industry of the 1970s allowed it to grow inefficient and vulnerable to foreign competition. It appears that we are making the same mistake. Our computer industry is now so dependent on this single vendor that any failure of Microsoft could be more damaging than the collapse of Enron.

USING DIVERSITY AS A DEFENSE

It can be easily demonstrated mathematically and with computational simulations that an infrastructure based on diversity is less likely to experience a total failure from a single cause. So when we base our information infrastructure on a single operating system, we are making the same mistake as those who chose a single variety of chestnut tree to shade the streets of American cities. We become vulnerable as those who depended on potatoes for their sole source of food in the 1850s. We needn't repeat this mistake, but if things don't change I fear that we will. Nimda, Code Red and variants caused an estimated \$15 Billion worth of damage. My logs showed that infected Microsoft Windows computers tried to install one of these worms on my computer about 100 times per hour. These attacks were unsuccessful only because my computer was not compatible.

I was fortunate to have developed software under multiple operating systems. My most recent project under Microsoft Windows was the development of software to install security patches, Y2k patches and anti-virus software while removing unnecessary vulnerable features which Microsoft installs by default. I began to see that much of our software industry is dedicated to overcoming limitations in Microsoft Windows. Here are some examples:

- 1) Viruses, worms and other vulnerabilities can access all data on a computer and possibly the entire local network.
- 2) A single application failure can cause a computer to crash.
- 3) Network configuration changes, security patches or software install usually require a reboot. Dozens of reboots may be necessary to install software for a typical business.
- 4) The last 3 characters of a filename determine which application is used open the file, but they are often hidden from the user. Creators of simple-minded worms such as "Melissa" and "I Love You" can fool a user into invoking powerful system tools simply by naming the worm something like "hello.doc.vbs" or "hello.pps.reg"
- 5) Large businesses must work with thousands of computers which may have subtle differences in DLL version numbers, installed patches, hardware interrupts. There is no significant barrier between user data and system data which would allow a corporation to deploy a common environment to its entire workforce. Each computer becomes as unique as a snowflake and the number of potential configuration problems can equal or exceed the number of computers.

Users of Microsoft Windows demand ever faster processors and more memory, but give little thought to the above limitations. They are taken almost as laws of nature to be ignored or worked around. But most of these problems are unique to Microsoft Windows. They were solved long ago by companies such as Sun, Apple, IBM, HP and Digital. The inertia of a non-competitive industry has locked us in the technological dark ages.

ALLOWING CONSUMERS TO USE THE RIGHT TOOL FOR THE JOB

When Microsoft captures the market for a product such as a web browser word processor or media player, it has a choice. It can integrate all of these products into Windows or it can pare them down to something marketable to the widest audience. In either case, it is Microsoft, not the consumer, who makes this decision. We are forced to use a tool that is not optimal for our needs. Most people do not need the IIS webserver that came with certain versions of Windows. As we've seen, these unnecessary features can open up significant security vulnerabilities.

One argument against a strong remedy is that "Microsoft makes good products." This implies that their market position was attained through honest competition and . This is simply not true. Microsoft employs some very talented developers and packages software that meets some consumer needs. Perhaps they could have attained their current market share without illegal anti-competitive practices, but it is now impossible to know.

A careful examination does show that there are very few unique ideas in Microsoft's middleware or operating system products. Microsoft's strength comes not from superior technology, but from the exclusive control of most aspects of an integrated environment. It is only when Microsoft forces the consumer to take it's products "all or nothing" that it can wedge all potential competitors out of a market. The default Microsoft configurations may be appropriate for many small business and home users but they are not the optimal for artists, writers, teachers, scientists, doctors or software engineers. They are a "least common denominator."

REENABLING THE EXCHANGE OF INFORMATION

It is in the public interest that files and documents maintain compatibility between different types of computers and between different versions of an application. It is in Microsoft's interest to break compatibility with versions of it's own applications and with competing middleware products. When I receive an email containing an attachment written in the latest version of Microsoft Word, I am forced to upgrade to the sender's version of Word, or hope that my favorite competing product is somehow able to read it, or I can ignore the email.

Competitors must devote significant resources in decoding Microsoft's undocumented formats so that their applications can share information. Because of it's marketshare, Microsoft has the luxury of remaining incompatible with competitor's formats.

Shortly after the September 11th attack, the U.S. Government announced a Broad Agency Announcement calling for proposals on anti-terrorism technology. Requirement 3.2.2 of this document states:

3.2.2 File Format and Content

The White Paper shall be prepared in color or black and white in Microsoft (Office-98) Word or Adobe PDF (Version 4 or higher) electronic file format.

The document must be print-capable and without password, using text font and graphic file formats that will cause the document to be NO LARGER THAN

500KB IN FILE SIZE.

Numerous other examples can be found by searching <http://www.google.com> with the keywords: "white paper" rfp format "microsoft word" shall

This default sole-sourcing of Microsoft products is very common on .gov, .us and .mil sites. Why are we storing important government documents in an undocumented proprietary format which is likely to become obsolete next year? Why not use an industry standard such as HTML, RTF, UNICODE or ASCII? Why would the U.S. government accept a format that is known to host hundreds of viruses that already caused billions of dollars worth of damage? It is because few are aware of an alternative.

At one time it seemed that the popularity of HTML would solve this compatibility problem. I could view the same webpage on a Sun workstation, a Windows PC, and the text-based "lynx" browser which is useful for the blind or those with slow network connections. By 1998 many websites began using Microsoft proprietary technology in such a way that the lynx browser no longer worked. This problem continues to worsen. Today many web pages are no longer work properly on computers which don't run Microsoft Windows. Information access is increasingly being tied to the products of a single company.

PROPOSED REMEDY

A truly competitive market should lead to a system where the consumer and producer's needs are balanced. Microsoft's monopoly status allowed it to shift this balance away from the consumer and at the same time prevented competitors from filling the void in the market. My proposed remedies would address specific problems in the computer industry which were caused by this imbalance:

(1.)

PROBLEM: It is in Microsoft's interest to change data formats often so that users are forced to upgrade. It is also in their interest to make their format incompatible with competitors and other industry standards. It is in the public interest that these formats remain stable.

REMEDY: Microsoft data formats must not change for 5 years unless the following conditions are met:

a) The proposed change to the format is published one year prior to its release.

b) The source code for converting between old and new formats is published.

c) The proposed change must be agreed to by a consortium of at least 10 competitors.

d) The proposed change must be voted on by a majority of consumers that is greater than Microsoft's market share for the specific type of product.

(2.)

PROBLEM: Microsoft continues to extend its influence into other areas and is on track for making the internet a Microsoft proprietary medium.

REMEDY: Any new API or Protocol that Microsoft deploys on the public internet must meet the criteria for data formats which is described in section (1.)

(3.)

PROBLEM: Microsoft packages software in such a way that users must pay for content which they don't need and which degrades the security and performance of their computer.

REMEDY: All documented APIs shall be called "The Operating System." All undocumented API's shall be called "Middleware."

a) Microsoft shall provide the capability to remove all undocumented APIs without degrading the performance or functionality of documented APIs.

b) Microsoft must reduce the cost of this stripped "Operating System" by an amount proportional to the development cost of the the software that was removed.

(4.)

PROBLEM: Microsoft's dominance on the desktop leaves our information infrastructure vulnerable to attack.

SOLUTION: Microsoft shall remit a fine of \$10 Billion which is to be placed in a fund which will be used to purchase computers for schools, charities, government and non-profit agencies and foreign aid. These computers shall be configured to be incompatible with all existing Microsoft products.

(5.)

PROBLEM: It is in Microsoft's interest to obsolete certifications as often as possible. It is in the public interest that this knowledge be general and usable in the future.

SOLUTION: Microsoft shall reimburse students for the cost of any certification which becomes obsolete within 5 years of its creation.

SUMMARY

Our free market system is by far the most efficient economic system, but it becomes unstable and dangerously inefficient when an industry is so dominated by a single vendor even in the case where the vendor acts in what it believes is the most benevolent manner. The Sherman anti-trust act is a safety valve which must be used to re-level the playing field when such an imbalance occurs. If fair remedies are not implemented in this case, our important computer technology sector will fall behind and damaging monopolies may soon encompass other industries.

Respectfully Yours,
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